

June 30, 2021

New Hampshire Site Evaluation Committee
21 South Fruit Street, Suite 10
Concord, NH 03301-2429

RE: Letter - K. Allen Brooks, Senior Assistant Attorney General, Chief, Environmental Protection Bureau Council for the Public – Comments on Investigation on Complaints Regarding Antrim Wind Energy Facility (Sound Complaints) (Docket No. 2021-02; Docket No. 2015-02)

Dear Administrator and Committee Members:

I respectfully respond to Mr. Brooks letter.

The N.H. CODE ADMIN. RULES, Site 301.14 (f)(2)(a) are intended to protect neighbors from excessive noise produced by Antrim Wind. The Rule established the ‘maximum’ A-weighted equivalent sound level measured in 0.125-sec intervals without averaging, i.e., LAeq125ms. Integrating sound level meters sample at 48 kHz, thereby 6000 samples to compute LAeq125ms. The Rule requires ANSI S12.9 Part 3 to verify wind turbines are either ‘steady’ fluctuating ≤ 3 dB for averaged Leqs, or dominant ≥ 6 dB to be assessed with ambient background include.

Qualifications: 40-years’ experience with community sound impact assessments, industrial noise control, and acoustic evaluations, member of Acoustical Society of America (ASA) and Institute of Noise Control Engineering (INCE) with Board Certification. Respect professional and INCE ‘Canons of Ethic’ to protect public health, safety, and wellbeing. Experience has shown that neighbor noise complaints are more often due to incomplete community noise assessments.

Background: NH Site Evaluation Committee minutes¹ of the July 10, 2013: pages 55 to 61. The discussion was about 40 dBA versus long-term yearly-average with the latter being dismissed based on previous applications for Lempster and Groton. Docket No. 2015-02, March 17, 2017, Decision and Order Granting Application², page 153, (2) Subcommittee Deliberations (below) with emphasis.

The Subcommittee finds that the Sound Assessment report prepared by Mr. O’Neal was prepared in accordance with professional standards and our administrative rules. The Subcommittee notes that the Applicant guaranteed that noise levels associated with the Project will not exceed the requirements set forth in N.H. CODE ADMIN. RULES, Site 301.14 (f)(2)(a), i.e. the greater of 45 dBA or 5 dBA above background levels, measured at the L-90 sound level, between the hours of 8:00 a.m. and 8:00 p.m. each day, and the greater of 40 dBA or 5 dBA above background levels, measured at the L-90 sound level, at all other times during each day. See N.H. CODE ADMIN. RULES, Site 301.14 (f)(2)(a). In addition, the Noise Reduction Operation feature of the turbine will allow the Applicant to reduce sounds emitted by the turbines when necessary.

¹ <https://www.nhsec.nh.gov/projects/2012-01/documents/130207minutes201201am.pdf>

² https://www.nhsec.nh.gov/projects/2015-02/orders-notices/2015-02_2017-03-17_order_final_decision.pdf

Review of Mr. Brooks letter follows:

Paragraph 2:

The Subcommittee must interpret N.H. ADMIN. R. Site 301.14(f)(2). This rule hinges on the application of the L₉₀ standard. This standard functions by averaging data over a time interval; therefore, it only has meaning if such a time interval is specified. Unfortunately, the Site Evaluation Committee (“Committee”) rules do not specify a time interval in this context. The Certificate of Site and Facility (“Certificate”) also does not specify a time interval.

Response 1 – Sentence 1: Rule shown below:

Site 301.14 (f)(2)a - With respect to sound standards, the A-weighted equivalent sound levels produced by the applicant’s energy facility during operations shall not exceed the greater of 45 dBA or 5 dBA above background levels, measured at the L-90 sound level, between the hours of 8:00 a.m. and 8:00 p.m. each day, and the greater of 40 dBA or 5 dBA above background levels, measured at the L-90 sound level, at all other times during each day, as measured using microphone placement at least 7.5 meters from any surface where reflections may influence measured sound pressure levels, on property that is used in whole or in part for permanent or temporary residential purposes, at a location between the nearest building on the property used for such purposes and the closest wind turbine.

Response 2 – Sentence 2:

Rule does not hinge on L90. The Rule establish the ‘shall not exceed’ A-weighted equivalent sound level measured in 0.125-second intervals abbreviated LAeq0.125sec or LAeq125ms. The Rule establishes the maximum LAeq125ms at 45 dBA daytime and 40 dBA nighttime, or 5 dB above the ambient background without the turbines operating. Antrim Wind ambient background L90s were previously measured by Acentech during winter of 2020 with L90s below 30 dBA for turbines not operating. Therefore 5 dB increase above ambient is not applicable.

Response 3 – Sentences 3, 4 and 5:

The Rule does not require sound levels to be averaged.

Paragraph 3

The complainants have advocated for the use of the 1/8th (0.125) second interval described in N.H. ADMIN. R. Site 301.18(e)(6). However, this rule is meant to describe the minimum time interval for data collection. As reflected in Subcommittee questions, it would be meaningless to have the time interval for data collection and the time interval for averaging be the same as one cannot “average” one data point. There is also nothing in the rules to suggest that importing this time interval for use with the L₉₀ standard was in any way intended by the drafters.

Response 5 – Sentence 1 Rule cited:

Site 301.18 (e)(6): “All sound measurements during post-construction monitoring shall be taken at 0.125-second intervals measuring both fast response and Leq metrics; ...”

Response 6 – Sentence 2:

The Rule requires sound levels to be averaged for individual 0.125-second intervals using fast response 1/8th-second time-weighting and Leq metrics. A Class 1 integrating sound level meter sampling at 48 kHz would compute an LAeq125ms from 6000 sound level samples.

Response 7 - Sentence 3:

The Rule for 0.125-second LAeqs is not meaningless that can be conservatively reported in 0.100-second intervals data logged by the meter.

Response 8 – Sentence 4:

The Rule has no provisions for importing other time intervals for other metrics: L90.

Paragraph 4:

Antrim Wind Energy, LLC (“Antrim Wind”) has advocated for a one-hour time interval based in part upon the language of the Committee’s rules. For instance, an expert for the facility stated that “[t]he only time periods referenced directly” in Committee rules “are the 12 hours during the day and the 12 hours during the night.... Thus, the Leq time period can be interpreted as” establishing a 12-hour interval. RSG letter to Jean-Francois Latour of the Transalta Corporation, dated March 22, 2021, pg. 2, footnote 1; *see also* N.H. ADMIN. R. Site 301.18(e)(6). However, this 12-hour measurement is in no way related to the time interval for the L₉₀ measurement. In truth, nowhere do the rules state or imply the use of any particular time interval. I further note that one document from Antrim Wind states that ANSI standards “recommend” the use of a one-hour interval while alluding to the fact that Committee rules often cite to ANSI standards. TransAlta Corp. letter to Pamela Monroe, SEC Administrator, dated July 17, 2020 (“ANSI S12.9-2013 part 3 does not have a strict requirement on the specified time, but *recommends/refers* to 1 hour:”) (emphasis added)). Although it appears from material provided by Antrim Wind that a one-hour interval for some purposes is “common,” I have not seen anything documenting that such an interval is “recommended” for the purposes at issue here. *See* RSG letter to Jean-Francois Latour of the Transalta Corporation, dated March 22, 2021, pg. 2, second numbered paragraph (“This is the method required under the standard ANSI S12.9 Part 3. This standard states that a *common* averaging time for the Leq is one hour”) (emphasis added)). Therefore, the rule language and more generalized background information alone do not provide a firm basis for choosing a one-hour standard.

Response 8 – Sentences 1 and 2:

The Rule defines daytime from 7:00 am to 7:00 pm and nighttime from 7:00 pm to 7:00 am. There is no suggestion that 12-hour day or night are considered averaging time periods.

Response 9 – Sentences 3 and 4:

There is No Thus to invoke a new interpretation to amend the Rule for LAeq125ms intervals to 12-hour periods consisting of 4,320,000 100-ms intervals.

Response 10 – Sentence 5:

The Rules states 0.125-second intervals. L90 measurement intervals are not defined by the Rule.

Response 11 - Sent.6

ANSI only refers to 1-hour and recommends shorter time intervals when applicable.

Response 12 – Last Sentence:

Antrim Wind Energy agreed to the Rule for 0.125-second 'shall not exceed' LAeqs. RSG and Epsilon Associates used a similar argument opposing Almer Township's 'not to exceed' for not requiring averaging. RSG and Epsilon lost this argument, which required submitting a memo³ to the client increasing Leq to Lmax by increasing Leq by 11 dB. (excerpt shown below)

Based on the factors listed above, it is very difficult to quantify the additional adjustment necessary to conduct a modeling study of Lmax for a wind energy project. This necessitates the addition of a highly conservative adjustment factor to estimate an operational Lmax. The MassCEC study, depending on what table is viewed and other post-construction measurements, ranges LFmax2 values from about 6 dB to 11 dB greater than the Leq, although some degree of background contamination is included in those Lmax values. For this study, to be conservative, we are using an additional 11 dB adjustment above the +2.0 dB already modeled.

Paragraph 5:

Several other options are also available to the Subcommittee. The Subcommittee could decide, for instance, that the time interval should be as close to instantaneous as possible. A small number of data points would provide sufficient detail to allow averaging and apply the L90 standard. However, in resolving any ambiguity in the rule as applied to the facility in the Certificate, the Subcommittee should consider the intent of the Committee at the time the project was approved. It is possible that a requirement this strict would result in a threshold that virtually no wind facility would be able to meet. See Epsilon Associates, Inc. letter to Jean-Francois Latour of the Transalta Corporation, dated March 22, 2021, pg. 3. It is unlikely that the Committee intended to approve a project while simultaneously intending to impose conditions that would ensure it would never operate.¹

³ RSG Memo to Ryan Pumford, NextEra Energy Resources, LLC from Ken Kaliski, RSG and Richard Lampter, Epsilon Associates, December 22, 2016.

Response 13 – Sentences 1 and 2:

The Rule does not allow for an instantaneous sound level measurement.

Response 14 – Sentence 3:

L90s based on a small number of data points have a high 'measurement-uncertainty' factor.

Response 15 – Sentence 4:

There is no ambiguity for "shall not exceed" noise limits.

Response 16 – Sentence 5 to last:

The Rule does not have provisions to modify requirements for wind turbines that cannot comply. Epsilon Associates understood the Rule stipulated "shall not exceed" during permit application testimony and after submitting Reference 3 memo, to another client, to correct for under-predicting.

Now that Antrim Wind sound level measurements are louder than "shall not exceed", Epsilon wants to change the Rule. Epsilon Associates is only responsible to Antrim Wind Energy for not complying.

This completes my review.

Feel free to contact with any questions about my professional opinions.

Thank you.

Respectfully submitted,


Stephen E. Ambrose, ASA, INCE, Board Certified emeritus

ps: Why do neighbors report hearing wind turbines, yet acoustic experts⁴ are unable to report same?

⁴ *The Wind Turbine Noise Technical Activity Committee is focused on the education of INCE members and the broader community on wind turbine noise, its generation, control, prediction, policy and regulation. It serves as a professional forum for the exchange of technical ideas and the dissemination of science-based information. It supports the **promotion of unified practices for noise measurement**, modeling and other related topics by encouraging papers to be presented at Internoise and NOISE-CON sessions and workshops on wind turbine noise." **emphasis**. Committee chaired by Ken Kaliski – RSG and Rob O'Neal – Epsilon Associates.
<https://www.inceusa.org/about-ince-usa/technical-activities/>, bottom of page,*